

REMARKS

Claims 1-21 are pending in the application with claims 1, 4, 11, 17, 19, and 21 being the independent claims. Claims 4-16, 19, and 20 are withdrawn as being drawn to a non-elected invention. Claims 1-3, 17, 18, and 21 stand rejected.

Restriction

The Office Action restricted claims 1-21 of the application into two groups. Group I includes claims 1-3, 17, 18, and 21, while Group II includes claims 4-16, 19, and 20. Applicants affirm the election of Group I.

Rejection Under 35 U.S.C. § 101/112

The Office Action rejected claims 1-3, 17, 18, and 21 under 35 U.S.C. § 101, as being directed to non-statutory subject matter. By this Reply, Applicants amend independent claims 1 and 21 to recite that steps of the method of claim 1 are performed by a controller and that the claimed system of claim 21 includes a controller. Accordingly, the claims are now directed to statutory subject matter, e.g., the controller configured to perform the claimed functions. Therefore, Applicants respectfully request that the Examiner withdraw the rejection.

Applicants traverse the rejection with respect to claim 17 because claim 17 recites a system including tanks and a controller configured to perform recited steps. Because the claim recites structure, the subject matter cannot be performed in the mind of the user or by use of a pencil and paper, as suggested in the Office Action. Therefore, the claimed tanks and controller apply, involve, use, or advance the technological arts. And therefore, claim 17 is directed to statutory subject matter. Therefore, Applicants respectfully request that the Examiner reconsider claim 17 and withdraw the rejection.

The Office Action rejected claims 1-3, 17, 18, and 21 under 35 U.S.C. § 112, first paragraph, as being not supported by an asserted utility or a well established utility because one skilled in the art would not know how to use the claimed invention. In view of the amendments

to independent claims 1 and 21 reciting a controller and the original features recited in claim 17, Applicants respectfully submit that the claims lack of utility rejection should be withdrawn.

In addition, the preamble of claim 1 recites, “[a] method for identifying a tank containing a liquid from N number of tanks in a semiconductor manufacturing facility into which a batch of semiconductor products is to be processed.” This “identifying a tank” from a number of tanks in a semiconductor manufacturing facility is a utility. As stated in paragraph 33, these methods optimize the capacity of processing tools.

This optimization may enable the utilization of all tanks of the process tool 346, or may at least minimize the number of tanks not being used. For example, in a chemical etch process tool, the method for optimizing the process capacity may include designating a process recipe and a plurality of recipe steps in such a way that the tanks are used in a relatively efficient manner in terms of capacity.

See Specification, paragraph 33. One skilled in the art will most certainly recognize the utility and value of optimizing to utilize all tanks or minimizing the number of tanks not being used. By using the claimed processes, manufacturing efficiencies may be obtained by distributing the workload through multiple tanks.

As set forth in the specification, the claimed subject matter has utility. Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

Rejection Under 35 U.S.C. § 112

The Office Action rejected claim 2 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point and distinctly claim the subject matter of the invention. The Office Action states that claim 2 does not further restrict the method of claim 1, but only modifies a variable which has no impact on the method of claim 1. Applicants respectfully traverse the rejection. First, claim 1 recites a method. Therefore, non-structural limitations still carry patentable weight. Second, claim 2 recites that “the batch number associated with the batch to be

processed is representative of the number of batches that have been processed in the liquid in the tanks” Accordingly, claim 2 further defines and narrows the batch number recited in claim 1. The batch number, as recited in claim 1, is used to determine the recipe index, which in turn, is used to determine the tank in which the batch is to be processed. Accordingly, the method of claim 2 does further restrict the method of claim 1 because in claim 1, the batch number need not be representative of the numbers of batches processed. Therefore, the batch number in claim 1 could be some other value or designation.

Because claim 2 further defines the batch number, which affects the determination of the tank as recited in claim 1, claim 2 does have an impact on the method of claim 1. Applicants respectfully request that the Examiner withdraw the rejection of claim 2.

Rejection Under 35 U.S.C. §103

The Office Action rejected claims 1-3, 17, 18, and 21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,439,824 to Harris et al. (“Harris”).

Claim 1 recites:

A method for identifying a tank containing a liquid from N number of tanks in a semiconductor manufacturing facility into which a batch of semiconductor products is to be processed, the method comprising:
receiving an incoming batch of products to be processed in a predetermined number of tanks housing the liquid;
identifying a batch number of the batch;
determining with a controller a recipe index from a modulus of N divided by the batch number; and
determining with the controller the tank into which the batch is to be processed from the modulus of the sum of the recipe index and the predetermined number of tanks, divided by N.

Independent claims 17 and 21 recite some similar features.

Harris discloses an automated semiconductor immersion processing system. The processing system includes a stocker module (22), an immersion module (24), and a process module (26). The immersion module (24) includes a first tank assembly (100) set up as a chemical process tank, a second tank assembly (102) providing a quick dump rinse, and a third tank assembly (104) providing wafer drying. See Harris, column 3, lines 56-62. An immersion robot (106) carries wafers (115) to the first tank assembly (100) for processing, then to the second tank assembly (102) for rinsing, and then to the third tank assembly (104) for drying. See Harris, column 5, lines 8-52.

It is submitted that, in the present case, a *prima facie* case of obviousness has not been established. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be some expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. See MPEP § 2142, citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In this case, Harris falls short on each of the three basic criteria.

1. Harris Does Not Teach or Suggest all the Claimed Subject Matter

The Harris patent cannot be applied to reject claim 1 under 35 U.S.C. § 103 which provides that:

A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ... (Emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim

must be evaluated. However, Harris does not teach or suggest all the limitations of claim 1, claim 17, or claim 21. The Office Action states that Harris does not show the claimed features of “identifying the batch number, finding the remainder when the batch number is divided by the number of tanks, and using that number tank.” See Office Action, page 5. Nevertheless, the Office Action asserts that “the use of the modulus decision system is a well-known and inherent concept in many everyday tasks.” See Office Action, page 5.

Applicants agree that Harris does not teach all the features of the claims. However, Applicants submit that Harris also does not suggest any method or system of “identifying a tank . . . into which a batch of semiconductor products is to be processed” with all the limitations recited in any of claims 1, 17, and 21. Instead, Harris teaches a system where a robot incrementally moves wafers from a first tank to a second tank and then to a third tank. Each tank has different fluids, and the processing must occur in order to achieve the desired result. Accordingly, even if a modulus decision system were well known, as suggested in the Office Action, there is no suggestion in Harris or in the allegedly “well known” modulus decision system to perform steps of “identifying a batch number of the batch; determining with a controller a recipe index from a modulus of N divided by the batch number; and determining with the controller the tank into which the batch is to be processed from the modulus of the sum of the recipe index and the predetermined number of tanks, divided by N .” It simply is not taught or suggested in Harris. Further, it simply is not taught in the art cited by the Examiner relating to congruency. Because neither Harris nor the art relating to congruency teaches or suggests all the features of claim 1, claim 1 should be allowable over Harris. For this reason alone, the rejection of claims 1, 17, and 21 should be withdrawn.

2. The Proposed Modification of Harris Does Not Provide a Reasonable Expectation of Success

In addition to not teaching or suggesting all the features of claim 1, there is no reasonable expectation of successfully modifying Harris to perform the features recited in claim 1 without

rendering the system of Harris inoperable for its intended purpose. For example, Harris includes three tanks with each batch being processed in order - first in the chemical processing tank assembly (100), then in the rinsing tank assembly (102), and finally in the drying tank assembly (104). If Harris were to perform the steps recited in claim 1, as suggested in the Office Action, then a first batch would begin in the chemical processing tank assembly (100), while a second batch would begin in the rinsing tank assembly (102), and a third batch would begin in the drying tank assembly (104). However, for obvious reasons, the batches being processed in the rinsing tank and drying tank, before being processed in the chemical processing tank, would not produce acceptable semiconductors. Simply said, the system in Harris requires that processing of batches occur in the chemical processing tank assembly (100) first. Because to interchange starting tanks would render two out of three batches useless, the proposed modification of Harris to perform the recited features of claims 1, 17, and 21, does not provide a reasonable expectation of success. Therefore, Applicants respectfully request that the rejection of claims 1, 17, and 21 be withdrawn.

3. There is No Suggestion or Motivation to Modify Harris

In addition to the reasons discussed above, Harris also fails to establish a *prima facie* case of obviousness because it fails to provide some suggestion or motivation to include the claimed subject matter. The Office Action itself is silent as to any motivation for modifying Harris to perform the method recited in claim 1. It does state, however, that "it would have been obvious . . . to use the modulus division system as well known in the art as a way to decide the destination tank of Harris because of the known mathematical theory of congruency." See Office Action, page 6. Applicants submit that the existence of a mathematical theory does not by itself provide motivation to modify the semiconductor immersion processing system disclosed in Harris.

Harris itself provides no motivation for the modification. In fact, the teachings of Harris show that such a modification would provide no benefit, and be virtually unusable in the

immersion processing system of Harris. For example, Harris discloses a system where a robot incrementally moves wafers from a first tank to a second tank and then to a third tank. Each tank has different fluids, and the processing must occur in its designated order to achieve the desired result. Because the order is pre-established and required, generating a recipe index for the immersion system disclosed in Harris would necessarily require that every batch have the same recipe index, e.g., transferring every wafer batch from tank one to tank two to tank three. Accordingly, because there can be no variation in order, there is no motivation to perform a method of “identifying a tank containing a liquid from N number of tanks . . . into which a batch of semiconductor products is to be processed.” In Harris, every batch will be first immersed in tank one. There is no other recipe. To try to implement another recipe, such as immersing the wafers in the rinse tank or the dryer tank first, would not provide the desired semiconductor. Accordingly, Applicants submit that there is no suggestion or motivation to modify Harris to perform the claimed methods. Therefore, Applicants respectfully request that the Examiner withdraw the rejection and allow claims 1, 17, and 21.

Claims 2, 3, and 18 depend from and add additional features to independent claims 1 and 17. Therefore, these claims should be allowable for at least the reasons that claims 1 and 17 are allowable. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection and allow these claims.

4. The recognition of a problem, or of the source of the problem, is not obvious even though the solution to the problem may be obvious

In the present case, it is apparent from a reading of the Harris patent that the problem of inefficiencies resulting from the lack of utilization of all tanks is simply not recognized. First, in Harris, there is no lack of efficiency because any batch placed in tank one, must then be placed in tanks two and three. Thus, this is a classic example of a solution to a problem being obvious only after recognition of the problem by the Applicants and is part of the “subject matter as a

whole" language of 35 USC § 103 which should always be considered in determining the obviousness of an invention under this statute.

Thus, for this independent reason, the burden of factually supporting a *prima facie* case of obviousness has not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Conclusion

For at least the reasons set forth above, independent claims 1, 17, and 21 are in condition for allowance. Dependent claims 2, 3, and 18 depend from and add additional features to the independent claims and, therefore, also are in condition for allowance. Accordingly, Applicants respectfully request that the Examiner withdraw the outstanding rejections and issue a formal notice of allowance.

Please grant any extension of time required to enter this response and charge any additional required fees to our Deposit Account No. 08-1394.

Respectfully submitted,

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